

# GENERAL DENTISTRY

## 61-15 Esthet-X Micro Matrix Restorative

(Project 00-01)

Esthet-X is a light-cured micro-hybrid resin composite designed for use as a direct restorative in all cavity classes in the anterior and posterior dentition. According to Dentsply/Caulk, it is also indicated for direct veneering, cosmetic reshaping (e.g., incisal lengthening, diastema closure), and for indirect fabrication of inlays, onlays, and veneers. Dentsply/Caulk claims that Esthet-X has excellent polishability, beautiful esthetics, is nonsticky with sculptable handling, and exhibits superior physical properties. In short, the company claims it is a resin composite that combines the polishability of a microfill with the physical properties of a hybrid. Esthet-X is available in 31 shades and three different opacities (opacious dentin, body, and translucent enamel) to enable clinicians to restore the tooth with, as Dentsply/Caulk terms it, "the natural beauty of vital teeth."

Compositionally, Esthet-X's resin matrix (a urethane-modified Bis-GMA) is based on the matrix used in TPH Spectrum. The resin is filled to 60% by volume (77% by weight) with bariumaluminofluoroborosilicate glass (BAFG) and nano-sized silicon dioxide particles. The BAFG filler particles range in size from 0.02 to 2.5 microns (with an average of from 0.6 to 0.8 microns) while the silicon dioxide particles range from 10 to 20 nanometers. Instructions recommend a short (20-second) light curing time for each 2-mm increment. The product is provided with TruMatch, an innovative "3D" shade guide with tabs that have been formed from various combinations of the different opacious, body, and translucent shades.

### Manufacturer:

L.D. Caulk Division  
Dentsply International, Inc.  
P.O. Box 359  
Milford, DE 19963-0359  
(800) 532-2855  
(302) 422-4511  
(800) 788-4110 FAX  
[www.caulk.com](http://www.caulk.com)

### Suggested Retail Price:

\$483.50 Compules Tips Complete System (item no. 630003)  
-115 0.25-g Compules Tips (31 shades provided)  
-one 4.5-mL bottle of Prime & Bond NT  
-one 3-mL syringe of 34% Tooth Conditioner Gel  
-1 TruMatch Shade Guide  
-10 Enhance Finishing Discs  
-25 Enhance Polishing Cups  
-one 4-g syringe of PrismaGloss Fine Polishing Paste  
-one 4-g syringe of PrismaGloss ExtraFine Polishing Paste  
-one Enhance metal mandrel  
-one Compules Tips Dispensing Gun  
-one technique guide  
-accessories

### Government Price:

\$290.00 Compules Tips Complete System (item no. and contents as listed above)

### ADVANTAGES:

- + Excellent shade matching, polishability, and overall esthetics.
- + Users were impressed with large number of shades.
- + Handles well; easy to place and manipulate.
- + Requires only a 20-second light exposure for adequate curing.
- + Very high degree of radiopacity; can easily be distinguished from enamel on radiographs.
- + Comparable in hardness to other popular hybrid resin composites.

- + Comparable in diametral tensile strength to Z250 (3M).
- + Includes effective Enhance Finishing/polishing System.
- + Provided with well-performing, easy-to-use dentin bonding product.
- + Instructions are supplemented with high-quality, graphics-containing technique booklet.
- + Lot numbers and expiration dates given for all components.
- + Provided with effective, innovative shade guide.
- + Provided with all necessary Material Safety Data Sheets (MSD Ss).

#### **DISADVANTAGES:**

- Packaging design is poor.
- Is too sensitive to ambient light.
- Too few compules are provided for the most commonly-used shades.
- More expensive than several currently-available hybrid resin composites.

#### **SUMMARY AND CONCLUSIONS:**

Esthet-X was well-received by clinical users who rated it very highly for its ease of handling, broad range of shades, easy polishability, and excellent overall esthetics. The kit is very complete with bonding agent, polishing system, and custom shade guide. Esthet-X performed well in the DIS laboratory, and while more expensive than several popular hybrid resin composites, is comparable in cost to its direct competitor, Point 4 (Kerr). Arguably, the product's main disadvantage is its current packaging design. Among its poor features are tray covers that can loosen and cause compules to spill from their containers. Also, shade numbers imprinted on the tray covers and compules are difficult to read and the compules color-coded tips are too similar in some cases to make visual identification possible. Users should note that Esthet-X is somewhat sensitive to ambient light and can polymerize prematurely if being used for large restorations where placement time is longer. **Esthet-X Micro Matrix** resin composite is rated **Acceptable** for use by the federal dental services.

(Col Charlton)

## **61-16 Point 4 Optimized Particle Composite System**

**(Project 00-02)**

Point 4 is a light-cured ultra-small particle resin composite designed for use in all cavity classes in the anterior and posterior dentition. Kerr claims that Point 4 combines the polishability/esthetics of a microfill with the strength of a hybrid. It is available in 22 shades which include 16 Vita-indexed base shades, 3 extra-light shades, and 3 translucent shades. Kerr claims that this range of shades provides the user with the ability to create true, lifelike restorations.

Compositionally, Point 4's Bis-GMA resin matrix is based on the matrix used in its popular products, Herculite XRV and Prodigy. The resin is filled to 57.2% by volume (76% by weight) with barium aluminoborosilicate glass and fumed silicon dioxide filler particles. The filler particles have an average size of 0.4 microns (hence the name Point 4) and 90% of the particles are smaller than 0.8 microns. Kerr claims that by incorporating a polymerizable dispersant it has been able to: (1) increase the percentage filler level and (2) use filler particles with an average size that is smaller than that used in traditional hybrid resin composites. This is purported to provide the material with excellent esthetics and strength properties.

#### **Manufacturer:**

Kerr Corporation  
 1717 W. Collins Avenue  
 Orange, CA 92867-9880  
 (800) 537-7123  
 (714) 516-7400  
 (714) 516-7633 FAX  
[www.kerrdental.com](http://www.kerrdental.com)

#### **Suggested Retail Price:**

\$238.50    Point 4 Unidose Kit (item no. 29685)  
               -50 0.2-g Unidose Tips (10 each of shades A2, A3, A3.5, XL2, T1)  
               -25 pouches of OptiBond Solo Plus  
               -two 3-g syringes of Kerr Gel Etchant  
               -one 5-mL bottle of OptiGuard Surface Sealant  
               -one Unidose Dispensing Gun  
               -accessories

**Government Price:**

\$135.85 Point 4 Unidose Kit (item no. and contents as listed above)

**ADVANTAGES:**

- + Available in a wide range of shades and different opacities.
- + Overall esthetics was rated very highly by clinical evaluators.
- + Handles extremely well; viscosity and ease of placement are excellent.
- + Adequate radiopacity; should not present the possibility of diagnostic misinterpretation on radiographs.
- + Comparable in hardness to other popular hybrid resin composites.
- + Compactly packaged in a user-friendly plastic "tackle box."
- + Is supplied with an easy-to-use, unit-dose dentin bonding product, OptiBond Solo Plus.
- + Comes with summary instruction card for bonding agent.
- + Capsule dispensing gun is provided in kit.
- + Unidose capsules have long nozzle that facilitates direct placement.
- + All components have lot numbers and expiration dates on them.

**DISADVANTAGES:**

- Kit contains only 5 of the 22 available shades.
- Kerr data indicate Point 4 has a tensile strength less than that of Z100 (3M) and TPH (Dentsply/Caulk).
- More expensive than several currently-available hybrid resin composites.
- Requires a 40-second curing time.
- No Material Safety Data Sheet shipped with product.

**SUMMARY AND CONCLUSIONS:**

Point 4 resin composite was very well-received by clinical users who particularly appreciated its ease of handling and excellent overall esthetics. In general, it performed well in the laboratory but did not distinguish itself as being better than other hybrids with regard to tensile strength or hardness. Its primary disadvantage is that although it is available in a large number of shades, only five are provided in the standard kit. A growing trend among new resin composites is for their manufacturers to recommend a shorter (i.e., 20-second) curing time per 2-mm increment than the standard 40-second duration. Point 4 takes more time to place because it still uses a 40-second curing duration per increment. Point 4, while more expensive than several popular hybrid resin composites, is comparable in cost to its direct competitor, Esthet-X (Dentsply/Caulk). **Point 4** is rated **Acceptable** for use by the federal dental services. (Col Charlton)

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## **61-17 Zaris Professional Tooth Whitening System (Project 00-09)**

The Zaris Professional Tooth Whitening System is a carbamide peroxide home bleaching gel from 3M Dental Products. The mint-flavored gel is available in 10% and 16% concentrations and, according to 3M, is most effective when used to lighten teeth that appear yellow, orange, or light brown. The version of Zaris evaluated by DIS contained six syringes of 16% carbamide peroxide gel, a travel case for the patient tray, and a patient instruction card. Product use instructions are provided for the dentist as well as instructions for the technician for tray fabrication. One-millimeter-thick clear tray blanks are provided and are used with a vacuum machine to make the bleaching trays. Two treatment options are listed for patients: daytime wear for 30 minutes twice a day or nighttime wear for one to two hours. Overnight application is also acceptable. 3M claims the product can produce a noticeable lightening in as few as three days, however it usually takes one to two weeks to produce the desired result. One of the differences between the Zaris System and other products is that it comes with a polypropylene insert that is applied to the cast prior to tray formation. The insert bonds to the tray during fabrication and acts as a reservoir for the gel. This obviates the need for a more time consuming way of incorporating a reservoir space, such as the use of blockout resin.

**Manufacturer:**

3M  
Dental Products Division  
3M Health Care  
3M Center, Bldg 275-2SE-03  
St. Paul, MN 55144-1000  
(800) 237-1650  
(612) 733-8524  
(800) 888-3132 FAX  
[www.3m.com/dental](http://www.3m.com/dental)

**Suggested Retail Price:**

\$312.50 Zaris Professional Tooth Whitening System, 16% (item number 6790-V) contains:

- six individual patient kits; each kit contains:
  - six 2.4-g syringes of whitening gel
  - one travel/storage case
  - one laminated patient instruction card
- 15 Zaris Gel Retention Inserts
- 15 tray blanks
- staff and patient education materials
  - one easel-backed patient information tear-off pad
  - one staff instruction sheet
  - one tray fabrication instruction sheet
  - reorder form for additional education materials

**Government Price:**

\$187.50 Zaris Professional Tooth Whitening System, 16% (item number and contents as listed above)

**ADVANTAGES:**

- + All 10 patients treated in the evaluation reported being "Very Satisfied" or "Satisfied" with their results.
- + Gel's high viscosity helps retain it in the tray.
- + Comes with well-designed travel kit for storing tray and bleaching syringes.
- + pH matches the value claimed by manufacturer; should prevent enamel demineralization from gel during treatment.
- + Tray insert is easier and quicker way of providing gel reservoir than traditional blockout/reservoir methods.
- + Is available in 10% and 16% concentrations.
- + Clear, user-friendly instruction card for patients.
- + Expiration date clearly indicated on syringes.

**DISADVANTAGES:**

- Some clinicians may find the tray material to be too thin and lack durability.
- Some cases of thermal sensitivity and gingival irritation occurred during the evaluation.
- More expensive per milliliter than several other popular products.
- Not shipped with Material Safety Data Sheet (MSDS).

**SUMMARY AND CONCLUSIONS:**

Zaris was judged to be very effective by clinicians and patients during this evaluation. The bleaching gel is appropriately thick which helped retain it in the tray. Also contributing to its retention is a self-adhesive strip that is used to facilitate the formation of a reservoir space during tray fabrication. Some users, however, may find the tray material to be thinner than they are used to. The product, while effective, does cause some of the common side effects reported for many popular bleaching products such as gingival irritation and thermal sensitivity. The gel's mint flavor was acceptable to patients but other products are available in a range of flavors that may be more acceptable to some patients. The product is not shipped with its MSDS, which can be a problem for some facilities, but 3M provides it after purchase. Zaris is more expensive per milliliter than several other popular products (e.g., Nupro Gold, Dentsply/Ash; VivaStyle, Vivadent; Opalescence, Ultradent). **The Zaris Professional Tooth Whitening System is rated Acceptable** for use by the federal dental services.

(Col Charlton)

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**61-18 A.S.A.P. Restore Resin Composite**

**(Project 99-48)**

According to its manufacturer, A.S.A.P. Restore is a microhybrid resin composite suitable for use as an anterior and posterior restorative. Product literature reports the resin is filled to 74% by weight (52% by volume) with filler particles having an average size of 0.7 microns. The filler is a combination of 0.7-micron barium glass and 0.01-micron silica.

Although A.S.A.P. Restore is available in 16 shades indexed to the Vita shade guide (as well as 6 modifier shades), the kit evaluated by DIS had seven Vita-indexed shades (A2, A3, A3.5, B2, B3, C2, D3). The resin is supplied in unit-dose capsules referred to as "ampules" and is provided with DMD's fifth-generation dentin bonding agent, A.S.A.P. Primer/Bond. The product and accessories are packaged in a paperboard rectangular box with a removable paperboard cover. Inside the box, a thin, plastic sheet covers the tray to help keep the ampules within their individual wells. The acid etchant and bonding agent have lot numbers and expiration dates stamped on them, however the ampules bear only a shade

designation. Their lot number and expiration date appear on a stamp affixed to the side of the box cover.

It is interesting to note that although the product is called A.S.A.P. Restore in DMD's ordering/pricing literature, the box bears the name Apollo Restore. Similarly, product literature refers to the bonding agent as A.S.A.P. Primer/Bond but the bottle has a label reading Apollo Dentin Bond. "A.S.A.P. Restore" will be used throughout this report when referring to the resin composite.

**Manufacturer:**

Dental Medical Diagnostic Systems, Inc.  
6416 Variel Avenue  
Woodland Hills, CA 91367  
(800) 399-0999  
(818) 932-2300  
(818) 595-0226 FAX  
www.dmdcorp.com

**Suggested Retail Price:**

\$199.99 A.S.A.P. Restore Ampule Kit (order number 010-1282) contains:  
-70 0.3-g ampules (10 each of shades A2, A3, A3.5, B2, B3, C2, D3)  
-one 5-mL bottle of A.S.A.P. Primer/Bond  
-one 4-g syringe of gel etchant  
-accessories

**Government Price:**

\$129.99 A.S.A.P. Restore Ampule Kit (contents and order number as listed above)

**ADVANTAGES:**

- + Nearly twice as radiopaque as required.
- + Comparable in hardness to other popular hybrid resin composites.
- + Requires only a 20-second light exposure for adequate curing.
- + Easy to polish.
- + One of the least expensive resin composites evaluated by DIS.
- + Ampules (i.e., capsules) are individually stamped with shade.

**DISADVANTAGES:**

- Some users may find the resin is difficult to handle due to tackiness.
- Bonding agent in kit was beyond its expiration date.
- As delivered, resin composite and etching gel were to expire in less than a year.
- Small, plastic flecks from capsules were extruded with resin.
- Product instructions and advertising brochure each recommend a different light curing time.
- Requires particular gun dispenser which is not provided in kit.
- Thin, plastic tray cover permits capsules to spill from containment wells during shipment.
- Not provided with summary instruction card for bonding agent.
- No Material Safety Data Sheet included.

**SUMMARY AND CONCLUSIONS:**

While A.S.A.P. Restore performed acceptably in the laboratory and is relatively inexpensive, it received some of the lowest scores and harshest comments from clinical users ever encountered during a DIS composite evaluation. While it performed adequately as an esthetic restorative material, the evaluators were disappointed with its handling and/or packaging. For instance, some users felt the resin was tacky, which made placement difficult. Others were frustrated by the fact that the ampules (i.e., capsules) do not fit all manufacturers gun dispensers. This is especially problematic because DMD does not include the required gun dispenser in the kit. In addition, some users felt that the product's shade matching ability was not as good as that of other composites, and one clinician noted plastic flakes from the ampules in the resin when it was dispensed. Surprisingly, when the product was delivered to DIS for evaluation, the bonding agent in the kits was beyond its expiration date and the composite's expiration date was less than a year away. None of the evaluators recommended this product be used in their clinics in place of the hybrid resin currently used. **A.S.A.P. Restore** is rated **Marginal** for use by the federal dental services.  
(Col Charlton)

Update: A.S.A.P. Restore is now available from New Wave Dental, Inc. at (888) 913-9899.

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## 61-19 Astropol Finishing and Polishing System

(Project 00-13)

The Astropol Finishing and Polishing System from Vivadent is a new product for finishing and polishing resin-based restorative materials. It consists of rubber points (small and large), cups, and disks in three grits mounted on metal, latch-type mandrels. The F (Finishers) grit is impregnated with silicon dioxide and is used to remove excess resin and pre-polish the restoration. The second grit, P (Polishers), also contains silicon dioxide and is used for producing a high gloss with microfills. The last grit, HP (High Polishers), contains silicon dioxide and fine diamond particles to produce a high luster on the surface of hybrid resin composites. The Astropol Assortment Package contains 24 finishers/polishers in a 4 inch X 6 inch plastic bur block with a removable clear plastic cover. Vivadent claims the finishers/polishers can be autoclaved for multiple uses.

### Manufacturer:

Ivoclar North America  
175 Pineview Drive  
Amherst, NY 14228  
(800) 533-6825  
(716) 691-0010  
(716) 691-2285 FAX  
www.ivoclarna.com

### Suggested Retail Price:

\$99.00 Astropol Finishing and Polishing System Assortment Package (item number 557625)  
-12 F Finishers  
-8 P Polishers  
-4 HP Polishers

### Government Price:

\$35.50 Item number and contents as listed above

### ADVANTAGES:

- + Various sizes and shapes allow for good access for finishing/polishing.
- + Metal-less finishing disks prevent marring of the restoration's surface during finishing.
- + All points, cups, and disks are pre-mounted on latch mandrels for rapid placement in handpiece.
- + Can be autoclaved for multiple uses.
- + Concise instruction booklet describes product use clearly.
- + Provided with Material Safety Data Sheet (MSDS).

### DISADVANTAGES:

- Finish produced was generally adequate, but two of the five users felt it was inferior to that achieved with other products.
- F finishers are inefficient at removing excess composite.
- Too few HP-grit polishers are provided.
- Disks have a thicker edge than those of other products (e.g., Sof-Lex, Enhance) which users may find limits interproximal access.
- Shade difference between the color-coded grits is minimal making it difficult to differentiate between them.
- Plastic holding block is larger than it needs to be.
- Instructions refer to expiration date, but none is given.

### SUMMARY AND CONCLUSIONS:

In general, clinical evaluators found that the Astropol system produced an acceptable, but not outstanding polish for their resin-based restorations. Several nice features are seen with the system's points, cups, and disks such as their different sizes and shapes, absence of metal hubs, and premounting on latch-type mandrels. Unfortunately, the product's advantages and disadvantages are evenly matched, which make it difficult to recommend Astropol as a substitute for current polishing/finishing systems. The **Astropol Finishing and Polishing System** is rated **Acceptable** for use by the federal dental services.

(Col Charlton)

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## 61-20 Prompt L-Pop All-in-One Adhesive

(Project 00-11)

Prompt L-Pop is a water-based, two-liquid, light-activated dentin bonding agent marketed by the ESPE America Company. It is recommended for bonding directly-placed, light-activated resin composites and

compomers to enamel and dentin. Other advertised uses include as an adhesive for fissure sealing and orthodontic bracket attachment. It is important to note that Prompt L-Pop is recommended for use only with light-activated materials and not with chemical- or dual-activated ones. This is because the acidic component of the Prompt L-Pop interferes with the setting reaction of chemical- or dual-activated materials.

Prompt L-Pop is unusual in at least two respects. First, it is one of only four bonding agents packaged in unit-dose packaging, the other three being OptiBond Solo Plus (Kerr), Prime & Bond NT (Dentsply/Caulk), and Excite (Vivadent). More importantly, Prompt L-Pop is the only product that contains all three traditional bonding agent components (etchant, primer, adhesive) in one solution that is applied to tooth structure. In essence, the product etches, primes, and seals all in one application step. Because of this, ESPE America claims that the product has several important advantages compared to currently available fifth-generation bonding agents. These include: a dramatically reduced application time, greater simplicity of application, less susceptibility of the components to volatilization, and improved infection control. The company also maintains there is less post-treatment sensitivity than with other bonding agents because resin penetration is equal to dentin demineralization and this prevents nanoleakage.

The first step in applying Prompt L-Pop is to sequentially combine the two liquids that make up the product by squeezing their blister packs and using the resulting mixed liquid to wet an attached disposable applicator. The applicator is then used to apply the mixed liquid to the enamel and dentin for 15 seconds. After evaporating the agent with a gentle application of compressed air, the restorative material is applied and light activated. ESPE America notes in product instructions that the user may optionally cure the bonding agent with a 10-second light exposure prior to placing the restorative material, if desired.

**Manufacturer:**

ESPE America  
1710 Romano Drive  
P.O. Box 111  
Norristown, PA 19404-0111  
(800) 344-8235  
(610) 277-3800  
(800) 458-3987 FAX  
[www.espeusa.com](http://www.espeusa.com)

**Suggested Retail Price:**

\$159.00 Prompt L-Pop All-in-One Adhesive Nomal Pack (item number 041910) contains:  
-one hundred (100) 0.12-mL L-Pops

**Government Price:**

\$103.35 Prompt L-Pop All-in-One Adhesive Nomal Pack (item number and contents as listed above)

**ADVANTAGES:**

- + Is extremely fast and very easy to use.
- + Available in single-dose containers that enhance infection control and make clean-up easy.
- + Routinely covers tooth structure with only one application.
- + Packaging takes up little space.
- + Is provided with simple, clear instruction card.
- + Instructions accurately describe product indications and use.
- + Expiration dates and lot numbers are stamped on individual items.
- + No offensive odor.
- + Includes a Material Safety Data Sheet (MSDS).

**DISADVANTAGES:**

- Bond strengths to dentin were the lowest of all the bonding agents tested thus far by DIS.
- Has limited clinical uses.
- Two-thirds of clinical users would not purchase the product for their clinics.
- No published studies assessing product's effectiveness.

**SUMMARY AND CONCLUSIONS:**

Prompt L-Pop is an innovative, unit-dose bonding product that is extremely quick to apply and easy to use. Its unit-dose packaging enhances infection control, prevents evaporation of the mixed agent, and makes clean-up easy. Unfortunately, the product has several important disadvantages. Prompt L-Pop's chief disadvantage is its low bond strength: the value was lower than that of any bonding product yet tested by DIS. Equally problematic is that Prompt L-Pop has limited clinical applications. For example, it can only be used with light-activated materials and is not used for such common bonding purposes as amalgam

bonding or porcelain repair. Also, because it is incompatible with chemical- or dual-activated materials, it can not be used as a dentin/enamel pretreatment prior to luting restorations with chemical-activated or dual-activated resin cements. **Prompt L-Pop** is rated **Marginal** for use by the federal dental services. (Col Charlton)

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## 61-21 Seal & Protect

(Project 00-14)

Seal & Protect is a clear solution supplied in a squeeze bottle that is recommended for the treatment of exposed, sensitive root-surface dentin. It is also recommended for reducing the dentin's abrasion and erosion. Seal & Protect's ability to reduce sensitivity, erosion, and abrasion is purportedly due to its ability to infiltrate and seal dentin tubules. The product consists of methacrylate resins, PENTA, nanofillers, Triclosan (a broad spectrum antibacterial agent), and acetone. Photoinitiators and stabilizers are also present.

To apply the product, the area to be treated is isolated, rinsed, and blot dried. Seal & Protect is then applied in sufficient amounts to keep the area wet for 20 seconds. A gentle stream of compressed air is used to volatilize the acetone solvent and the material is light cured for 10 seconds. A second coat is then applied, dried, and light activated. Dentsply/Caulk claims the product provides symptomatic relief for up to 6 months.

### Manufacturer:

L.D. Caulk Division  
Dentsply International, Inc.  
P.O. Box 359  
Milford, DE 19963-0359  
(800) 532-2855  
(302) 422-4511  
(800) 788-4110 FAX  
www.caulk.com

### Suggested Retail Price:

\$166.65 Seal & Protect Standard Kit (item number 658001) contains:  
-two 4.5-mL bottles of Seal & Protect  
-80 disposable brush tips  
-brush handle  
-dispensing well  
-instructions and illustrated technique guide

### Government Price:

\$100.00 Seal & Protect Standard Kit (item number and contents as listed above)

### ADVANTAGES:

- + Users judged it to be easy and fast to apply.
- + Generally effective at providing months-long relief of sensitivity.
- + Effects took place immediately after treatment.
- + Instructions are clear and concise.
- + Provided with a Material Safety Data Sheet (MSDS).

### DISADVANTAGES:

- Requires two separate applications.
- Must be light activated.
- Provided only partial pain relief for some patients.
- Clinicians found that its viscosity made it difficult to apply in a thin layer in the cervical third of treated teeth.
- Product box is larger than it needs to be.

### SUMMARY AND CONCLUSIONS:

Seal & Protect is a light-activated, resin-based solution applied to exposed, sensitive dentin for pain relief. The product was reported by clinical users to be effective for approximately 85% of treated patients, providing either partial or total relief from pain immediately after application. The users appreciated the product's ease and speed of placement. This is somewhat surprising because Seal & Protect is applied in two separate coats and must be light activated. Duration of relief varied by patient, however it often lasted several months. Product instructions are simple and clear and a Material Safety Data Sheet is included in

the box. The packaging is wasteful because the box is large relative to the amount of product included. **Seal & Protect** is rated **Acceptable** for use by the federal dental services.

(Col Charlton)

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## 61-22 DentalEZ AXCS Dental Unit

(Project 99-53)

The DentalEZ AXCS Dental Unit is an over-the-patient, chair-mounted dental unit that is compatible with the new version of the DentalEZ AXCS Model J Dental Chair. The unit's control head is capable of supporting three air-driven handpieces and a provided autoclavable three-way syringe. Its fiber-optic power supply can support three fiber-optic handpieces. A hinged panel on the control head allows quick access to the fiber-optic power supply and the control block for maintenance. A removable, stainless-steel instrument tray sits on the top surface of the control head. The side console houses a self-contained water system, electrical outlets, plumbing quick connections, and external air and water outlet connectors for accessories. The evaluation unit came with a cuspidor and a cup filler mounted on the support arm above the console. If the cuspidor is not desired, a moveable tray for accessories can be installed instead. An assistant's break-away arm provides holders for high volume evacuation, a saliva ejector, and a three-way air/water syringe. The suction has a rotary valve to shut off the vacuum, which facilitates cleaning of the horizontally-aligned filter. The dental unit has a sealed, programmable touch pad controls for the dental chair light located on the assistant's arm as well as on the Model J Dental Chair. An optional, sealed, touch pad that mounts on the control head and a foot control are also available. A maximum of two touch pads or a touch pad and a foot control can be installed on each DentalEZ dental operating system. The unit's painted finish is powder-coated for durability and its smooth surfaces and rounded corners are said to make cleaning easy. A three-year warranty is provided on the structures, controls, and electronics. The DentalEZ AXCS Dental Unit is UL and CE listed and is available in either 115-volt or 230-volt AC.

### Manufacturer:

DentalEZ Group  
2500 Highway 31 South  
Bay Minette, AL 36507  
(800) 275-7956  
(334) 937-6781  
(334) 937-0461 FAX  
www.dentalez.com

### Suggested Retail Price:

\$6025.00 DentalEZ AXCS Dental Unit

### Government Price:

\$2955.96 DentalEZ AXCS Dental Unit

### ADVANTAGES:

- + Smooth, rounded, aseptic design.
- + Unit, assistant, and chair touch pad controls (along with a foot control) are available to control the chair and dental light.
- + Handpiece and three-way syringe holders on the control head are adjustable.
- + Features individual handpiece drive-air and water adjustments.
- + Hinged panel allows easy access to plumbing connections and for servicing the control block.
- + Has a one-piece, quick-release, twist-lock coupler for installing and removing the handpiece hoses.
- + Has external air and water connections on the side console for use with accessory items.
- + Positive latch brake assembly for the control head arm.
- + Flex joint on assistant's arm helps to prevent damage if the chair is raised or lowered with obstructions in the way.
- + Rotary valve on high-evacuation suction allows easy control of function.
- + Easy-to-remove vacuum filter.
- + Durable, powder-coated finish.
- + Three-year warranty on structures, controls and electronics.

### DISADVANTAGES:

- DentalEZ demonstrated poor customer support during this evaluation.
- Right-to-left handed conversion is a lengthy 16-step procedure that requires tools and mechanical/electrical ability.

- The AXCS dental unit and light assemblies were unstable when mounted to the swing mount of the Model J-Chair.
- No On/Off indicator on unit.
- Control head air brake system can be difficult to use.
- Control head air brake button is located in a place that could predispose dentist to percutaneous injury from dental handpiece.
- Control head air/water adjustments are not clearly labeled and require special tool to adjust.
- Fiber-optic system requires application of air pressure to handpiece for activation.
- Majority of evaluators would not recommend this unit for federal customers.

#### **SUMMARY AND CONCLUSIONS:**

The DentalEZ AXCS Dental Unit met the laboratory testing requirements of ADA Specification #47, NFPA 99, and met most of the checklist items of the Medical Procurement Item Description #2. The unit has esthetic, smooth lines and contours, however it demonstrates a problematic lack of stability when installed on the DentalEZ model J-Chair. This lack of stability is so severe that the unit cannot be recommended for pediatric, oral surgical, or Navy shipboard dental practices. Right-to-left conversion of the dental unit (as configured) involves a 16-step process that requires assistance from a mechanical/electrical technician. The majority of the DIS Professional Staff rated this unit Average and would not recommend its purchase to federal service customers. During the evaluation, DentalEZ demonstrated poor customer support. The **DentalEZ AXCS Dental Unit** is rated **Marginal** for use by the federal dental services.

(Lt Col Roberts)

## **61-23 DentalEZ Model J-Chair**

**(Project 99-52)**

The DentalEZ Model J Dental Chair is an updated version of the original DentalEZ J-Chair which was introduced in 1958. It has an electronically-controlled, hydraulic, cantilever base that is claimed to provide smooth, jerk-free operation. The thin, tapered back is purported to allow improved access to the oral cavity. The J-Chair has one moveable armrest that lifts to allow access for patient entry and exit, while the other armrest is supported and stationary. Both arm rests have upholstered slings that move with the chair assembly and are designed to comfortably support the patient's arms in any chair position. A swivel-brake lever located beneath the seat provides a 30-degree horizontal rotation in the left or right direction for ease of patient access and for adapting the chair to fit an existing room. The J-Chair is designed to be compatible with DentalEZ's AXCS Dental Unit and AXCS Dental Light. A touch pad control or a foot control is used to select the chair functions and offers eight preprogrammed positions in addition to the manual control. Also, optional touch pads can be installed on the dental unit control head, assistant's unit, or dental chair. However, only a total of two touch pads, or a touch pad and foot control can be installed on each dental operating system. A three-year warranty is provided on the chair's structure, hydraulic system, controls, and electronics. The DentalEZ Model J Dental Chair is UL and CE listed and available in either 115-volt or 230-volt AC.

#### **Manufacturer:**

DentalEZ Group  
2500 Highway 31 South  
Bay Minette, AL 36507  
(800) 275-7956  
(334) 937-6781  
(334) 937-0461 FAX

#### **Suggested Retail Price:**

\$7,295.00 DentalEZ Model J Dental Chair

#### **Government Price:**

\$3,876.00 DentalEZ Model J Dental Chair

#### **ADVANTAGES:**

- + Is well constructed with pleasing contours and appearance.
- + Has eight, easy-to-program, pre-set positions combined with the conventional controls.
- + Covered with smooth, seamless upholstery that is easy to clean.
- + Has smooth, jerk-free, hydraulic, cantilever operation.
- + Thin, tapered back provides good access to the oral cavity.
- + Two different styles of magnetically-retained headrests are available.
- + Unit, assistant, and chair touch pad controls (along with a foot control) are available to control the chair and dental light.

- + Optional automatic chair lock-out prevents chair movement when a handpiece is running.
- + Moveable armrest allows easy patient access.
- + Armrest slings support patient's arms in all chair positions.
- + Three-year warranty on structures, hydraulic system, controls, and electronics.

#### **DISADVANTAGES:**

- Customer support from the manufacturer during this evaluation was poor.
- Requires tools and mechanical/electrical ability to complete the 16 steps necessary to convert the chair from right-to-left handed operation.
- The AXCS Dental Unit and Light assemblies are not stable when mounted to the J-Chair swing mount.
- Access to the chair-mounted touch pad controls is limited when the chair is in the operating position.
- Moveable armrest does not provide adequate leverage support for patient repositioning.
- The replacement parts listing does not provide exploded part identification drawings.

#### **SUMMARY AND CONCLUSIONS:**

The DentalEZ Model J-Chair met all laboratory electrical safety testing requirements as well as those of ADA Specification #46 and most of the checklist items of the Medical Procurement Item Description #2. DIS evaluators found the well-constructed chair to be esthetically pleasing and it operated smoothly. DIS, however, cannot recommend the Model J-Chair to be used combined with the DentalEZ AXCS Dental Unit because of a lack of stability. Converting the chair from right- to left-hand configuration is a 16-step procedure that requires the assistance of a medical equipment technician. One DIS Professional Staff evaluator rated the DentalEZ J-Chair "Excellent" while the majority of the other evaluators rated it "Good." It must be emphasized that this evaluation was plagued by poor customer service from the manufacturer. The **DentalEZ Model J Dental Chair** is rated **Acceptable** for use by the federal dental services.

(Lt Col Roberts)

## **61-24 AXCS Dental Light**

**(Project 00-17)**

The AXCS Dental Light has been recently introduced by DentalEZ. It has three-axis arm adjustment that is said to make the light pattern easy to position with glass-filled "Tee" handles designed to provide a cool gripping surface. The On/Off switch, which is also used to adjust the light's intensity, is claimed to be easily accessible and offers the selection of either a High (36,000 Lux) or Low (18,000 Lux) light intensity. The AXCS Light uses a 150-watt halogen bulb with a stated focal length of 20 to 45 inches and an advertised light pattern of 6½ X 3¼ inches. The clear protective bulb shield assembly clips into place and is purported to be easy to remove for cleaning. The On/Off functions of the light can be connected to the J Model dental chair's touch pad controls or those of the AXCS dental unit. A three-year warranty is provided that includes everything except the lens shields and bulb assembly. The AXCS Dental Light operates on 24-volt current provided by either a 115-volt or a 230-volt AC power supply.

#### **Manufacturer:**

DentalEZ Group  
2500 Highway 31 South  
Bay Minette, AL 36507  
(800) 275-7956  
(334) 937-6781  
(334) 937-0461 FAX

#### **Suggested Retail Price:**

\$1650.00 DentalEZ AXCS Dental Light

#### **Government Price:**

\$858.00 DentalEZ AXCS Dental Light

#### **ADVANTAGES:**

- + Esthetic, compact design.
- + Easy-to-reach On/Off switch.
- + Light intensity levels can be adjusted with On/Off switch.
- + Meets National Fire Protection Association (NFPA) 99 electrical safety requirements.
- + Meets ISO Standard 9680 requirements for illuminance pattern.
- + Three-year warranty (except for the bulb and the lens reflector).
- + Unit, assistant, and chair touch pad controls (along with a foot control) are available to control dental light function.

**DISADVANTAGES:**

- Combination On/Off intensity level switch is not labeled.
- Unstable when installed to the AXCS Dental Unit and mounted to the Model J-Chair.
- Does not meet ISO Specification 9680 for decreased illuminance in the field of the patient's eyes.

**SUMMARY AND CONCLUSIONS:**

The DentalEZ AXCS Light met electrical safety requirements of NFPA 99 as well as most of the checklist items of the Medical Procurement Item Description #2 for dental operatory lights. Although this light met the ISO 9680 Specification requirements for color temperature and light pattern, the light did not meet requirements limiting the amount of light reaching the patient's eyes. DIS Professional Evaluators found the light to be compact and esthetic. The majority of evaluators rated the AXCS Dental Light as above average. However, the light was found to be unstable when chair-mounted with the AXCS Dental Unit and J Chair. This is a concern with the treatment of pediatric patients where the patient is most often active or during oral surgical procedures when pressure may be applied to the head and neck area. Furthermore, due to the instability of this arrangement, the AXCS Dental Light cannot be recommended for US Navy shipboard dental clinics. As with the evaluations with the DentalEZ AXCS Dental Unit and Model J-Chair, this evaluation was hampered by poor customer service from the manufacturer. The **DentalEZ AXCS Dental Light** is rated **Acceptable** for use by the federal dental services.

(Lt Col Roberts)

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**61-25 ARC Light II**

**(Project 99-38)**

The ARC Light II is a microprocessor-controlled light that uses plasma-arc energy to rapidly cure light-activated dental materials. The manufacturer claims that the ARC Light II adequately polymerizes resin composites in as little as five seconds and offers conventional, ramped, or step cure modes. Irradiance intensity can be set up to 2000 mW/cm<sup>2</sup> (in five-percent increments) and time durations can be programmed in one-second increments. The ARC Light II has a built-in radiometer that is said to allow self-calibration to maintain optimum energy output for each programmed setting. This unit has a standard 8-mm curing tip on a 5½-foot, liquid-filled light guide. The ARC Light II is 5.7 H x 10.5" W x 11.2" D and weighs 10 pounds.

**Manufacturer:**

Air Techniques, Inc.  
70 Cantiague Rock Road  
P.O. Box 870  
Hicksville, NY 11802  
(800) 247-8324  
(516) 433-7676  
(516) 433-7684 FAX  
www.airtechniques.com

**Suggested Retail Price:**

\$4995 ARC Light II System; includes

- ARC Light II
- Hand-actuated liquid light guide with ring magnet
- Curing tip
- Disposable light shield
- Protective glasses
- Keys for power switch

**Government Price:**

\$3100 ARC Light II (as listed above)

**ADVANTAGES:**

- + Irradiance output is higher than that of conventional halogen curing units.
- + Irradiance spectrum is compatible with most resin composites.
- + Has three programmable curing modes.
- + Efficient lamp cooling design allows continuous curing modes.
- + Quiet cooling fan runs in proportion to unit use.
- + Instructions are complete and easy to understand.
- + Has built-in radiometer that enables unit to self-calibrate its irradiance output.
- + Light wand is well balanced and easy to control.
- + Has an easy-to-use, magnetically-retained finger switch on handpiece.

- + Safety features prevent incorrect use or inadvertent activation of light unit.
- + Allows quicker placement of orthodontic bands and appliances.

#### **DISADVANTAGES:**

- Expensive.
- Manufacturers recommended curing times do not adequately polymerize resin composite.

#### **SUMMARY AND CONCLUSIONS:**

The ARC Light II is a microprocessor-controlled, plasma-arc curing unit that features multiple programmable curing modes. The unit is solidly built with well designed engineering and safety features. The measured irradiance output was higher than that of conventional halogen lamp curing units, and its irradiance spectrum should be compatible with most resin composites. Clinical evaluators liked this unit's easy-to-operate controls, well-balanced handpiece, and magnetically-retained finger switch. The ARC Light II's irradiance level was sufficient to polymerize resin used to retain orthodontic brackets. Its short curing times saved valuable chair time during orthodontic treatment. It is important to note, however, that the manufacturer's recommended curing times are too short for adequate polymerization of restorative resin composites. Although expensive, the **ARC Light II** (when used as directed) should be acceptable for the luting of orthodontic appliances. However, due to its cost and inability to adequately polymerize resin composites using the manufacturer's recommended curing time, it is rated **Marginal** for the placement of definitive restorations by the federal dental services.

(Lt Col Roberts)

## **61-26 Optilux 501 Polymerization Unit**

**(Project 00-03)**

The Optilux 501 is Kerr/Demetron's newest entry into the visible light curing market. The Optilux 501 is an attractive, hand-held, corded, visible light polymerization system. It consists of a power unit that can be mounted on a wall or cabinet, or be left portable. The unit is connected to a pistol-style handpiece via a six-foot-long cord. It is equipped with Demetron's 80-watt quartz-halogen Optibulb and features a built-in digital radiometer. Two autoclavable curing tips, a 7-mm turbo-tip and an 11-mm standard tip, are included with the unit. The 501 provides a choice of several curing modes, including continuous high output, ramp, boost, and bleaching. The minimum output is reported to be 850 mW/cm<sup>2</sup> and, in the high output modes, the output is purported to be in excess of 1000 mW/cm<sup>2</sup>. The ramped mode begins at 100 mW/cm<sup>2</sup> and increases to 1000 mW/cm<sup>2</sup> in the first ten seconds; during the final ten seconds, the output is a continuous 1000 mW/cm<sup>2</sup>. An internal voltage regulator is standard and ensures a steady electrical supply that is reported to increase lamp life by eliminating voltage fluctuations to the unit. The cooling fan operation is proportional to the length of time the bulb was activated. The unit is available in both 120V and 220V models and is CSA certified. The Optilux 501 measures 8" H x 6.25" W x 7.5" D and weighs 6 lbs. 6 oz. The pistol handpiece weighs only 10 ounces.

#### **Manufacturer:**

Kerr/Demetron  
21 Commerce Drive  
Danbury, Connecticut 06810-4153  
(800) 444-3589  
(203) 748-0030  
(203) 791-8284 FAX

#### **Suggested Retail Price:**

\$1500.00 Optilux 501; includes  
     -12-volt/80-watt Optibulb  
     -11 mm diameter curved fiberoptic curing tip  
     -7 mm diameter turbo-tip  
     -protective light shield  
     -mounting bracket  
     -adjusting tool

#### **Government Price:**

\$852.15 Optilux 501 (as listed above)

#### **ADVANTAGES:**

- + Irradiance values are higher than those of most other units previously tested by DIS.
- + Offers variety of curing modes (continuous, ramp, boost, bleach).
- + Built-in digital radiometer.

- + Wide range of sterilizable curing tips available.
- + Curing tips swivel 360 degrees to facilitate intraoral access.
- + Has internal voltage regulator to ensure steady voltage supply to unit.
- + Light shield is easily positioned.
- + Audible time indicator has adjustable volume and interval settings.
- + Display gives the cumulative time the bulb has been illuminated.
- + Cooling fan operation is proportional to bulb usage.
- + Ergonomically-placed On/Off activation switch.
- + Has continuous-run mode (ie, operator can control duration of light exposure).
- + Easily cleaned or barrier protected.
- + CSA certified.

#### **DISADVANTAGES:**

- More expensive than other corded curing lights.
- Radiometer is not as accurate as manufacturer claims.
- Does not adequately cure resin composites using manufacturer's recommended preset times in ramp and boost modes.
- Power cord is easily dislodged from power unit.
- Activation trigger is easy to inadvertently activate when removing handpiece from the unit.
- Manufacturer recommends use of only one specific surface disinfectant on external surfaces.
- Clinical evaluators found the supplied curing tips were too short to easily reach 2<sup>nd</sup> molars.

#### **SUMMARY AND CONCLUSIONS:**

The Demetron Optilux 501 Polymerization Unit is well-designed, easy-to-use, and light-weight. One of the most powerful units evaluated by DIS, it is capable of producing an irradiance that is two to four times the value many researchers consider adequate to cure resin composite. However, DIS testing found that the manufacturer's recommended curing times for the boost (10 seconds) and ramped cure (20 seconds) modes were insufficient to adequately polymerize a 2-mm-thick increment of a microfill resin composite. This is not unique to this light and is in agreement with other DIS testing that ramped polymerization requires longer curing times compared to continuous, full-intensity polymerization. Autoclaving the curing tips resulted in minimal loss of light intensity and no deleterious effects on the physical integrity of the tips. It should be noted that only Cavicide, a Kerr product, is recommended for disinfecting the exterior surfaces of the unit. The manufacturer's instructions specifically prohibit use of denatured alcohol, isopropyl alcohol, Lysol, phenol, ammonia complex, or iodine complex solutions. All clinical evaluators rated the Optilux 501 as either "Excellent" or "Good." **The Demetron Optilux 501 Polymerization Unit is rated **Acceptable** for use by the federal dental services.**

(Col Leonard)

## **61-27 AirDent II**

**(Project 99-37)**

The AirDent II is a self-contained air abrasion system marketed by Air Techniques. Purported advantages of this unit compared to traditional air-turbine handpiece preparations include: less invasive, more conservative treatment; a reduced need for local anesthetic; earlier and more accurate diagnosis which reduces under- and/or over-treatment; and the reduction or elimination of vibration, chipping, and micro-fracturing of tooth structure during preparation. The AirDent II has dual chambers for use with either 27- or 50-micron aluminum oxide powder. Delivery is via a vibratory feed mechanism that is said to provide precise, consistent flow of powder. A console indicator light alerts the user when the chamber needs to be refilled. Air pressure is provided by an on-board, oil-less compressor while powder dryness is maintained with a rechargeable desiccant mechanism that has a powder dryness indicator. The console digital display has membrane-touch controls that allow the user to regulate the air pressure from 40 to 160 psi in 10-psi increments. The handpiece nozzle provided with the unit has a 70-degree angle; 12- and 105-degree nozzles are available separately. The AirDent II is 27.5"H x 11"W x 25"D and weighs 98 pounds. Powder overspray is purported to be adequately removed from the working field using a standard high-volume suction tip, however the manufacturer also markets the Dento-Vac, a vacuum device that is used at chairside to remove overspray.

#### **Manufacturer:**

Air Techniques, Inc.  
 70 Cantiague Rock Road  
 P.O. Box 870  
 Hicksville, NY 11802  
 (800) 247-8324  
 (516) 433-7676

(516) 433-7684 FAX  
www.airtechniques.com

**Suggested Retail Price:**

\$11,695     AirDent II Air Abrasion System; includes  
              -1 AirDent II unit  
              -2 Pairs of safety glasses  
              -1 Pair of goggles  
              -1 Hose assembly with swivel  
              -2 Handpieces  
              -2 70-degree tips  
              -2 250-gm containers of 27-micron alpha alumina particles  
              -2 250-gm containers of 50-micron alpha alumina particles

\$1495        Dento-Vac

**Government Price:**

\$8430        Air Dent II Air Abrasion System (as listed above)

\$930         Dento-Vac

**ADVANTAGES:**

- + Is a portable and self-contained unit with esthetically pleasing, smooth contours.
- + Manufacturer's operator manual is easy-to-read and adequate for clinical operation.
- + In-house training given by manufacturer provides excellent familiarization and reduces learning curve for first-time users.
- + Handpiece design and cord length allow good intraoral access for most clinical applications.
- + Controls are easy to see and use.
- + Passed requirements of all pertinent electrical safety standards.
- + Air pressure can be varied between 40 and 160 psi.
- + Oil-less compressor and in-board desiccant system provide adequate power and function.
- + Handpiece is sterilizable.
- + Unit's size fits well into existing facilities.
- + Dual chambers allow clinicians the choice of 27- or 50-micron alumina particles.
- + Features a proprietary vibratory powder-feed mechanism that prevents clogging.
- + Sensor in handpiece holder prevents inadvertent operation.
- + Safety feature automatically depressurizes powder chamber when access door is opened.
- + Is solidly constructed with quick-connect couplings and excellent labeling of internal components.
- + Excellent manufacturer technical support service.

**DISADVANTAGES:**

- Expensive.
- Has limited applications.
- Does not eliminate the need for anesthesia in all cases.
- Requires the purchase of additional vacuum device for adequate control of powder overspray.
- Requires longer tooth preparation time compared to a dental air-turbine handpiece.
- Does not totally replace the dental air-turbine handpiece.
- No available comprehensive troubleshooting guides, maintenance recommendations, or schematic diagrams for federal service medical equipment technicians.
- No instructions are provided with the Dento-Vac that describe its use.

**SUMMARY AND CONCLUSIONS:**

The AirDent II is solidly built, well designed, and effective for limited clinical applications. Delivery pressure can be varied between 40 and 160 psi, and the unit has an in-board air desiccant system and a vibratory powder-feed mechanism that generally produce consistent and dependable powder delivery. Clinical users can choose between 27- and 50-micron alumina powder. Safety features include automatic powder chamber depressurization with access door opening and a sensor that prevents inadvertent handpiece function when the handpiece is secured in the holder. Clinical users reported that the unit functioned reliably and was easy to use via its touch-membrane control panel. Local anesthesia was still required in some cases to provide adequate patient comfort. Powder overspray was a problem, and it is necessary to purchase an additional vacuum source to properly control it. Disadvantages included high cost, limited applicability, and poor maintenance documentation. The **AirDent II** is rated **Acceptable** for federal service use.

(Lt Col Roberts)

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## 61-28 Midwest XGT High-speed Handpiece

(Project 99-27)

The Midwest XGT Fiberoptic High-speed Handpiece was designed to be lightweight with a compact head for improved access to restricted areas of the mouth. It features the exclusive ComforTouch design that purportedly provides better balance and is more comfortable, reducing hand fatigue. The fiberoptics, which has been changed, fuses over 1000 fiberoptic strands into a solid glass rod that is claimed to provide considerably brighter light and longer durability than Midwest's previous fiberoptic technology. For the first time, the company offers a coupler-based 360-degree swivel and quick-disconnect. Two different couplers are available to fit existing five-hole fiberoptic or six-pin fiberoptic tubing. The XGT handpiece is equipped with an anti-retraction valve on the water tube to prevent backflow of contaminated fluids into the handpiece. The handpiece can be heat sterilized by autoclave and only requires lubrication prior to sterilization. The handpiece (including coupler) is 13.8 cm long and weighs 3.3 ounces. The handpiece head diameter and length are 10.5 mm and 13 mm, respectively. The distance from the back of the handpiece to the tip of a standard 19-mm-long bur is 22 mm (i.e., interocclusal clearance). The handpiece is warranted against defects in materials and workmanship for twelve months. The fiberoptics carry a 5-year warranty.

### Manufacturer:

Dentsply/Midwest  
901 West Oakton Street  
Des Plaines, IL 60018-1884  
(800) 800-2888  
(847) 640-4800  
(847) 640-4858 FAX

### Suggested Retail Prices:

XGT Handpiece	\$850.00
5-Hole Coupler	\$200.00
6-Pin Coupler	\$250.00

### Government Prices:

XGT Handpiece	\$459.00
5-Hole Coupler	\$108.00
6-Pin Coupler	\$135.00

### ADVANTAGES:

- + Excellent longevity following repeated use/sterilization.
- + Adequate power (10.6 watts).
- + Improved fiberoptics.
- + Anti-retraction valve in water tube.
- + 360-degree swivel coupler enhances ease of positioning and use.
- + Push-button bur release.
- + Small head size and visibility angle improves visibility and access.
- + Turbine is field replaceable which reduces down time.
- + Only requires lubrication before sterilization, enhancing infection control.
- + Five-year warranty on fiberoptics.

### DISADVANTAGES:

- Fiberoptics lost 45% of transmission over 1000 use/sterilizations

### SUMMARY AND CONCLUSIONS:

The Midwest XGT Fiberoptic High-speed handpiece represents the first substantial new handpiece design by Midwest in some time. With the XGT, Midwest finally offers a true quick-disconnect coupler and 360-degree swivel. Coupled with the push-button bur release, this model is more user friendly than previous Midwest high-speed handpieces. Contrary to evaluations of earlier Midwest models, 100% of the XGT test handpieces were functioning after 1000 use/sterilizations. In addition, concentricity was found to be improved over previous Midwest models. The free-running speed was measured and found to be 390,000 RPM at 35 psi, delivering an acceptable 10.6 watts of power. The turbine is field replaceable by authorized federal service dental clinics or can be serviced by Midwest via air express in two business days for essentially the same cost. Although the new fused fiberoptics performed better than those found in older Midwest models, DIS testing found that the handpieces still lost on average 45% of their original light transmission after 1000 use/sterilizations. The noise level of the handpiece was measured at 65.5

decibels, well below the maximum 8-hour, 85-dB(A) exposure limit established by the Occupational Safety and Health Administration (OSHA). Finally, the compact head increases operator visibility and interocclusal access. The **Midwest XGT** is rated **Recommended** for use by the federal dental services. (Col Leonard, Lt Col Howard Roberts, Mr Dan King)

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## **61-29 W&H/A-dec Synea TA-96L Fiberoptic High-Speed Handpiece (Project 99-28)**

The W&H/A-dec Synea TA-96L fiberoptic high-speed handpiece is imported from Austria and distributed by A-dec. The handpiece has a compact head and is designed for a wide range of dental restorative procedures. It is designed to be used with the W&H 924 Roto Quick Coupler, which provides 360-degree swivel and easy interchangeability of handpieces. The fiberoptic bulb is inside the handpiece to reduce the distance from the light source to the handpiece head. In addition, the fiberoptics have been changed to a solid glass rod that is claimed to provide considerably brighter light and longer durability than W&H's previous fiberoptic technology. The handpiece has a push-button autochuck and can be heat sterilized in either an autoclave or chemiclave. The free running speed is reported to be 350,000 RPM at 45 psi. A pressure-regulating screw is standard that allows the handpiece to be used with air line pressures of either 32 psi or 45 psi. It should be noted, however, that using the handpiece at 32 psi reduces its power by 20%. The turbine is field replaceable to reduce handpiece down time but A-dec recommends returning the handpiece to the company for servicing. The W&H Synea TA-96L (including coupler) measures 14 cm in length and weighs 2.6 ounces. The head diameter and length of the handpiece are 10.5 mm and 13 mm, respectively. The distance from the back of the handpiece to the tip of a standard 19-mm bur is 22.5 mm (i.e., interocclusal clearance). The handpiece is warranted against defects in materials and workmanship for twelve months.

### **Manufacturer:**

W&H Dentalwerk/A-dec  
2601 Crestview Drive  
Newberg, OR 97132  
(800) 547-1883  
(503) 537-2764  
(503) 538-8021 FAX  
[www.wnhdent.com/sinceframe.html](http://www.wnhdent.com/sinceframe.html)

### **Suggested Retail Prices:**

Synea TA-96L	\$890.00
924 Roto Quick Coupler	\$210.00
Replacement Turbine	\$295.00
Replacement Fiberoptic Bulb	\$33.50

### **Government Prices:**

Synea TA-96L	\$459.93
924 Roto Quick Coupler	\$108.52
Replacement Turbine	\$175.23
Replacement Fiberoptic Bulb	\$19.90

### **ADVANTAGES:**

- + Excellent longevity following repeated use/sterilization.
- + Adequate power (11.2 watts).
- + Superior concentricity ensures precise tooth preparations.
- + Accepts air line pressures of 32 psi or 45 psi.
- + 360-degree swivel coupler enhances ease of positioning and use.
- + Push-button bur release facilitates bur placement and removal.
- + Small head size and visibility angle improve visibility and access.
- + Turbine is field replaceable which reduces down time.
- + Only requires lubrication before sterilization, which enhances infection control.
- + 12-month warranty.

### **DISADVANTAGES:**

- Fiberoptics lost 79% of its transmission over 1000 uses/sterilizations.
- Chucking mechanism failed in 33% of test handpieces during the 1000-use evaluation.
- Internal fiberoptic bulb required frequent replacement.

## SUMMARY AND CONCLUSIONS:

The W&H Synea TA-96L fiberoptic high-speed handpiece performed better than average for most parameters evaluated. Its power (11.2 watts) was in the lower third of all models evaluated, but was well above the 5 watts required for clinical acceptability. The purportedly improved fiberoptic system did not perform well in this evaluation. It maintained only 21% of its fiberoptic intensity after 1000 simulated clinical uses/sterilization cycles, and the internal fiberoptic bulb failed frequently. W&H has now released the Synea TA-96LW which is identical to the Synea TA-96L except that the fiberoptic bulb is no longer inside the handpiece. This may improve the performance and longevity of the bulb since it will no longer be subjected to the rigors of sterilization. The noise level of the handpiece was 65 decibels, which falls well below the maximum 8-hour, 85-dB(A) exposure limit established by the Occupational Safety and Health Administration (OSHA). The Synea TA-96L's concentricity ranked in the upper half of handpieces previously evaluated by DIS. This is a property important for producing smooth finish lines and preparations consistent with bur size and shape. The evaluation also found that the handpieces compact head increased operator visibility and access. Four of the six test handpieces completed the 1000 simulated clinical uses/sterilization cycles without any degradation of power or speed. The two failures were due to chuck failure, not turbine performance, but since the chuck is an integral part of the turbine, when the chuck fails the entire turbine fails. The **W&H Synea TA-96L** is rated **Acceptable** for use by the federal dental services.

(Col Leonard, Lt Col Howard Roberts, Mr Dan King)

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## 61-30 W&H/A-dec Synea TA-98L Fiberoptic High-Speed Handpiece (Project 99-34)

The W&H Synea TA-98L fiberoptic high-speed handpiece is imported from Austria and distributed by A-dec. The handpiece has a standard-size turbine head with triple-spray cooling. It is designed for use by clinicians who routinely perform procedures that make significant demands on their handpiece (e.g., prosthodontists, general dentists with high-volume restorative practices, etc.). The handpiece utilizes the W&H 924 Roto Quick Coupler, which provides 360-degree swivel and easy interchangeability of handpieces. The fiberoptic bulb is inside the handpiece to reduce the distance from the source light from the handpiece head. In addition, the fiberoptics have been changed to a solid glass rod that is claimed to provide considerably brighter light and longer durability than W&H's previous fiberoptic technology. The handpiece has a push-button autochuck and can be heat sterilized in either an autoclave or chemiclave. The free running speed is reported to be 350,000 RPM at 45 psi. A pressure regulating screw is standard that allows the handpiece to be used with air line pressures of either 32 psi or 45 psi. Use of the handpiece at 32 psi reduces power by 20%. The turbine is field replaceable to reduce handpiece down time, but A-dec recommends returning the handpiece to them for servicing. The W&H Synea TA-98L (including coupler) measures 14 cm in length and weighs 2.6 ounces. The handpiece head diameter and length are 11.5 mm and 14.4 mm, respectively. The distance from the back of the handpiece to the tip of a standard 19-mm bur is 22.8 mm (i.e., interocclusal clearance). The handpiece is warranted against defects in materials and workmanship for twelve months.

### Manufacturer:

W&H Dentalwerk/A-dec  
2601 Crestview Drive  
Newberg, OR 97132  
(800) 547-1883  
(503) 537-2764  
(503) 538-8021 FAX

### Suggested Retail Prices:

Synea TA-98L	\$890.00
924 Roto Quick Coupler	\$210.00
Replacement Turbine	\$295.00
Replacement Fiberoptic Bulb	\$33.50

### Government Prices:

Synea TA-98L	\$459.93
924 Roto Quick Coupler	\$108.52
Replacement Turbine	\$175.23
Replacement Fiberoptic Bulb	\$19.90

### ADVANTAGES:

+ Excellent longevity following repeated uses/sterilization.

- + Superior power (16.5 watts).
- + Superior concentricity ensures precise tooth preparations.
- + Accepts air line pressures of 32 psi or 45 psi.
- + 360-degree swivel coupler enhances ease of positioning and use.
- + Push-button bur release facilitates bur placement and removal.
- + Turbine is field replaceable which reduces down time.
- + Only requires lubrication before sterilization which enhances infection control.
- + 12-month warranty.

#### **DISADVANTAGES:**

- Fiberoptics lost 76% of transmission over 1000 use/sterilizations.
- Chucking mechanism failed in 17% of test handpieces during 1000-use evaluation.
- Internal fiberoptic bulb required frequent replacement.
- Larger turbine results in decreased operator visibility and intraoral access.

#### **SUMMARY AND CONCLUSIONS:**

The W&H Synea TA-98L fiberoptic high-speed handpiece performed better than average for most parameters evaluated. It is the most powerful (16.5 watts) air-turbine handpiece ever tested by DIS. The purportedly improved fiberoptic system did not perform well in this evaluation. It maintained only 24% of its fiberoptic intensity after 1000 simulated clinical uses/sterilization cycles and the internal fiberoptic bulb failed frequently. W&H has now released the Synea TA-98LW which is identical to the Synea TA-98L except that the fiberoptic bulb is no longer inside the handpiece. This may improve the performance and longevity of the bulb since it will no longer be subjected to the rigors of sterilization. The noise level of the Synea TA-98L was 64 decibels, which falls well below the maximum 8-hour, 85-dB(A) exposure limit established by the Occupational Safety and Health Administration (OSHA). The Synea TA-98L's concentricity ranked in the upper half of handpieces previously evaluated by DIS. This is a property important for producing smooth finish lines and preparations consistent with bur size and shape. Five of the six test handpieces completed the 1000 simulated clinical uses/sterilization cycles without any degradation of power or speed. The one failure was due to chuck failure, not turbine performance, but since the chuck is an integral part of the turbine, when the chuck fails the entire turbine fails. **The W&H Synea TA-98L is rated Acceptable for use by the federal dental services.**

(Col Leonard, Lt Col Howard Roberts, Mr Dan King)

## **61-31 Validation of New Sybron Dental Specialties Amalgam Capsule Design (Project 00-41)**

Beginning in August 1997, Federal service dental clinics reported to DIS that mercury was being released during trituration from amalgam capsules made by Sybron Dental Specialties. This problem was the subject of a lengthy DIS Problem Resolution Assistance Program (PRAP) action. During the PRAP, DIS confirmed that a defective amalgam capsule design was responsible for the mercury release. It was also determined during the PRAP that mercury release during trituration had been an ongoing problem for many years with the capsules. The mercury release was replicated and confirmed in the DIS dental materials testing laboratory. Sybron Dental Specialties did modify the capsule design but that did not successfully resolve the problem.

The Defense Service Center Philadelphia (DSCP), upon the recommendation of the Joint Services Dental Material Coordinating Group, removed the National Stock Number (NSN) listing for all Sybron Dental Specialties amalgam products in the spring of 2000. It was the recommendation of the Joint Readiness Clinical Advisory Board (JRCAB) that no new NSN listing be provided for them unless new Sybron Dental Specialties amalgam capsules were shown to have corrected the problem of mercury release.

In May 2000, Sybron Dental Specialties marketed a new amalgam capsule. The new design features a physical locking of the capsule halves and uses a "pillow pack" for holding the mercury prior to trituration. Unlike the old capsules, the new ones are self-activating. DSCP and JRCAB asked DIS to evaluate the new capsule design before acceptance them into the federal service inventory.

#### **ADVANTAGES:**

- + Mercury leakage from inside of the new capsules was not observed during the evaluation.
- + Capsule design features physical interlocking of the internally beveled capsule halves.
- + Pillow pack mercury containment should prevent gross mercury contamination in the unlikely event that capsule halves are dislodged before trituration.
- + Dependably self-activating.
- + Capsule design allows the recapping of used amalgam capsules before disposal.

+ No mercury vapor was detected during trituration.

#### **DISADVANTAGES**

- Microscopic metallic mercury was observed on the capsules exterior.
- Microscopic droplets of mercury were found in the amalgamator mixing chamber following capsule mixing.

#### **SUMMARY AND CONCLUSIONS:**

Sybron Dental Specialties has a new dental amalgam capsule that is designed to prevent mercury leakage during trituration, which was observed with its previous amalgam capsule. The new amalgam capsules are self-activating and have both an internal-bevel overlapping internal seal and an outer physical-locking feature that should effectively impede the leakage of mercury during trituration. Mercury containment is accomplished with a pillow pack that should prevent mercury contamination in the unlikely event that the capsule halves become separated before trituration. No gross mercury leakage was observed during this evaluation and all capsules reliably self-activated. Some minor manufacturing assembly errors were noted, but they were within acceptable limits. Microscopic mercury contamination on the exterior of the capsules was noted, which may have been the reason for microscopic mercury contamination in the mixing chamber of the amalgamator after trituration. It is important to note, however, that other manufacturers capsules show similar contamination on their capsules external surfaces. The **new amalgam capsule** by Sybron Dental Specialties, which will consist of amalgam products to include **Tytin, Tytin FC, Contour, and Sybraloy** is rated **Acceptable** for use by the federal dental services.

(Lt Col Roberts)

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## **61-32 Delton FS+ Flowable Sealant**

**(Project 00-18)**

Delton FS+ flowable sealant is based on the familiar Delton pit and fissure sealant system that has been in clinical use for over 20 years. Delton FS+ features the Direct Delivery System, which consists of a brush-tipped applicator at the end of a unit-dose delivery tube. The manufacturer states that this brush-tipped cartridge provides easy application and allows the clinician to work the sealant material into pits and fissures. Delton FS+ is said to contain two sources of fluoride and requires 20 seconds of visible light curing for polymerization. Dentsply Preventive Care states that Delton FS+ is filled 55 percent by volume to provide adequate wear resistance. The sealant is available in both tooth-colored and opaque shades.

#### **Manufacturer:**

Dentsply Preventive Care  
1301 Smile Way  
P.O. Box 7807  
York, PA 17404-0807  
(800) 989-8826  
(717) 767-8502  
(800) 278-4344 FAX  
[www.prevent.dentsply.com](http://www.prevent.dentsply.com)

#### **Suggested Retail Price:**

\$136.50 Delton FS+ Introductory Kit (item number 2995)  
- 50 cartridges (total of 4 mL of sealant material)  
- 1 DDS autoclavable applicator  
- 1 EZ Etch Syringe (3 mL)  
- 25 etch syringe tips

#### **Government Price:**

\$82.08 Delton FS+ Introductory Kit (item number and contents as listed above)

#### **ADVANTAGES:**

- + Based on familiar Delton pit and fissure sealant material that has a long, positive, clinical performance history.
- + Contains fluoride.
- + Should be more wear-resistant than unfilled sealant materials.
- + Unit-dose delivery system integrates well into existing clinical application technique.
- + Phosphoric acid etch gel is easy to apply.
- + Enclosed instructions are easy to read and contain adequate detail.
- + Available in either tooth-colored or opaque shades.
- + Contains MSDS.

**DISADVANTAGES:**

- Applicator system may result in excess sealant material being expressed into pits and fissures.
- Sealant material's viscosity may produce voids and porosity when applied with the Direct Delivery System.

**SUMMARY AND CONCLUSIONS:**

Delton FS+ is a visible light-cured, unit-dose, fluoride-containing pit and fissure sealant that is available in two shades. The product's purported filler content of 55 percent should make Delton FS+ the most wear-resistant of all of Dentsply's marketed sealant materials. Delton FS+ is packaged with the Direct Delivery System, which features a brush tip at the end of the application cartridge. Clinical evaluators reported that Delton FS+ integrated well into their existing clinical technique, but some evaluators reported that the Direct Delivery System tended to express excess sealant material during application. Also, the viscosity of Delton FS+ may make it more suitable for preventive resin restorations than as a pit and fissure sealant.

**Delton FS+** is rated **Acceptable** for use by the federal dental services.

(Lt Col Roberts)

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**61-33 Prophylflex 2 Cleaning and Polishing System****(Project 98-57)**

The Prophylflex 2 is a self-contained, compact, air-driven handpiece that delivers water and abrasive mixture through a right-angle handpiece tip. The product is used for removing stain and plaque deposits from tooth structure. The device has a glass container located on the distal end of the handpiece into which abrasive powder is placed. Powder for the unit is sold by KaVo and ranges in size from 30 to 130 microns. It is available in an orange or neutral flavor, contains sodium hydrogen carbonate, and is sold in a unit-dose, 12-gram, foil package. Each box has one hundred packages. The Prophylflex 2 must be attached to a KaVo multiflex coupling for proper operation. Two quick-disconnect, 90-degree tips are also included. All Prophylflex 2 components are purported to be fully sterilizable. The main body of the handpiece is smooth while the upper half of the handpiece body is textured to aid in holding the handpiece.

**Manufacturer:**

KaVo America Corporation  
340 East Main Street  
Lake Zurich, IL 60047  
(888) 528-6872  
(847) 550-6800  
(847) 550-6434  
[www.kavo.com/english/startseite.htm](http://www.kavo.com/english/startseite.htm)

**Suggested Retail Price:**

\$1,135.00 KaVo Prophylflex 2 Kit (573-0730) contains:  
-one Prophylflex handpiece body with glass container  
-two tips  
-five packages of powder  
-four various sizes of cleaning tips

\$140.00 100 packages of foil powder

**Government Price:**

\$660.29 KaVo Prophylflex 2 Kit (item number and contents as listed above)

\$88.19 100 packages of foil powder

**ADVANTAGES:**

- + Removes stain effectively.
- + Connects to provider handpiece hose, requiring no other equipment.
- + Performance is excellent even after repeated handpiece sterilization.
- + Device worked well using another manufacturer's less expensive abrasive powder.
- + Quiet.
- + Easy to change tips.
- + Easy to refill powder container.
- + No complaints of sensitivity from patients during treatment.
- + Compact; ideal for small dental treatment rooms having little storage space.
- + Easy to clean.

#### DISADVANTAGES:

- Difficult to determine and change power settings.
- Brand of powder recommended for unit (KaVo) is more than twice as expensive as another popular manufacturer's powder.
- Powder is used up quickly.
- Users felt the unit was bulky, heavy, and cumbersome.
- Patients found the unit unattractive.

#### SUMMARY AND CONCLUSIONS:

The KaVo Prophylflex 2 is a quiet device that removes stain just as well as other air-driven abrasive units that DIS evaluators had used in the past. However, it was judged to be a little heavier than other units and was cumbersome to manipulate at first. Unlike other air-driven abrasive prophylaxis units, the Prophylflex 2 attaches to the dental unit air line, obviating the need for any modification of the dental unit. The product is compact and well-suited for operatories with little available counter or storage space. The KaVo powder supplied with the unit works well, however, at least one brand (Dentsply) of less expensive powder works just as well. Only two of five evaluators stated they would purchase the Prophylflex 2, probably because of the unit's bulkiness and weight. Interested potential buyers should try the unit (when possible) before buying it in order to determine if these characteristics are acceptable to them. The **Prophylflex 2 Cleaning and Polishing System** is rated **Acceptable** for use by the federal dental services.

(MSgt Belde)

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### 61-34 2000 DIS Equipment Survey

In August, the **Year 2000 Federal Services Equipment Survey** was mailed to all Department of Defense dental facilities. DIS had sent out a similar survey in 1995, the results of which were published in *Dental Items of Significance* #46 and #47. As with the previous survey, our objective was to compile data on the dental equipment currently being used by federal service dental facilities and to ascertain user satisfaction with this equipment. The survey was sent to all dental commanders who were asked to assign the task of completing the survey to the individual(s) who had the most knowledge and experience with a given piece of equipment. Each response represents the consensus of opinion from individual dental health care workers at each dental facility. Two hundred seventy-two (272) facilities (representing the Air Force, Navy, Army, Coast Guard, VA, Public Health, and Prison System) responded to the survey.

The survey reports on the following pieces of equipment: steam sterilizers, panoramic x-ray units, intra-oral x-ray units, x-ray autoproductors, curing lights, dental chairs, dental units, dental operating lights, high-speed handpieces, slow-speed handpieces, and triturators. When reading the results, please note that for each of the equipment items, a short narrative is presented that summarizes the overall results of the survey. For each type of equipment, graphs have been used to present: market share by company, market share by model, how satisfied users were with the item, to what degree it met their needs, and whether or not they would buy it again. Please note that each graph also presents the number of responses used to produce the results. For the market share graphs, the numbers represent total number of units (i.e., pieces of equipment). For the "User Satisfaction," "Meets Users Needs," and "Buy Again" graphs, the numbers indicate number of responses (i.e., facilities). DIS believes that the "User Satisfaction" and "Buy Again" graphs provide very useful information when making a purchasing decision.

A brand of equipment that you use in your clinic may not be mentioned in our equipment survey. You should not infer that these brands are inferior, however. The fact that they are not discussed simply indicates that we received an insufficient number of responses for them and, as a result, could draw no meaningful conclusions about their performance or value. Please also note that in some cases, certain models evaluated in the survey are no longer being manufactured or are now sold by other companies. These items are included in the results to assist consumers in making decisions about when and if an item should be replaced. If a potential replacement item is less reliable or user friendly than your present piece of equipment, you may want to keep it in service as long as possible.

Finally, each piece of equipment discussed in the survey is given a **"Consumer Satisfaction Score."** This score was developed by DIS in an attempt to condense and summarize all of the graphical information presented in the results. The following information about how the score was calculated is provided so that you better understand its significance and limitations. When users rated an equipment item during the survey, they were asked to rate their level of satisfaction with the item. Possible answers were "Very High," "High," "Average," "Low," and "Very Low." These possible choices were also given numerical scores (i.e., +2 for "Very High," +1 for "High," 0 for "Average," -1 for "Low," and -2 for "Very Low"). For each possible item choice, the number of respondents selecting the choice was multiplied by the numerical score assigned to the choice. These were then added together and averaged by dividing by

the total number of respondents. A similar calculation was done for the question asking the users to rate the item's ability to meet their needs. To obtain the Consumer Satisfaction Score for each equipment item, the two scores were added and averaged. The highest possible overall Consumer Satisfaction Score that an item could have is +2 and the lowest is -2. Small differences between Consumer Satisfaction Scores for products are probably of no meaningful importance. In fact, differences between products probably only become important to the consumer when scores vary by one full unit or more. In interpreting the scores, you should keep in mind that they are, by nature, subjective. Prior to purchasing any piece of equipment, consumers are advised to obtain and review a variety of information from many sources. By doing so, you will ensure that your decision is an informed one and you will maximize the chances that you will be satisfied with your selection.

(Col Bartoloni)

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### Visible Light Curing Units

Choosing a visible light curing unit is critical due to the growing number of light-activated dental materials that are becoming available. The majority of the market share by company (63%) is held by the Demetron Research Corporation (now owned by the Kerr Company); Caulk has one-fourth of the market (25%). The most popular model is the Optilux 400 (Demetron) which comprised 22% of the lights in the survey. The two other most common units are the updated Optilux 500 (14%) and Optilux 401 (14%) both manufactured by Demetron. In all three categories examined in the survey (i.e., User Satisfaction, Meets Users Needs, and Buy Again), the Optilux 500 received the highest scores, although in some cases the differences between the three models were not large. Positive comments received about the Optilux 500 included that it was easy-to-use, had good light output, and was more versatile than the other brands. Many customers commented that they appreciated the built-in light meter as well. Negative features included difficulty with disinfecting and barrier-protecting the unit. The Consumer Satisfaction Scores for the units were **Optilux 500 (+1.5), Optilux 401 (+1.3), and Optilux 400 (+0.9).**

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### Intraoral X-Ray Units

Today the dental community is flooded with new technologies in radiology, including direct current generators and digital sensors. The presence of these new technologies makes it more important than ever to have a high-quality intraoral x-ray unit for diagnostic and treatment planning purposes. Gendex (formerly General Electric) has 65% of the market share by company, followed by Siemens (13%), and Phillips (5%), which is now owned by Gendex as well. The most popular models are the Gendex GX-1000 (26%), Gendex GX-770 (19%), and the Gendex GX-900 (5%). Positive comments regarding the Gendex GX-1000 were that the unit was very reliable, sturdy, easy-to-operate, and rarely required repair. Criticism of it included its heavy, bulky design and occasional tube head drift. Positive comments about the Gendex GX-770 included that it was easy to maintain, lightweight, and well balanced. Negative comments were that its tube head drift required frequent, difficult adjustments. The Gendex GX-900 was found to perform admirably the majority of the time but, as with the other units, it too exhibited tube head drift. Overall, the majority of the respondents were very satisfied with the Gendex intraoral x-ray units. The Consumer Satisfaction Scores were **Gendex GX-770 (+1.4), Gendex GX-1000 (+1.2) and the Gendex GX-900 (+1.2).**

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### Panoramic X-Ray Units

There are many factors to consider when purchasing a panoramic unit. *Dental Items of Significance #44* provided a detailed discussion of some of the more important factors, and *Dental Items of Significance #53* had an updated synopsis of available units. The majority of the market share by company is held by Gendex (34%). Siemens, Planmeca, and J. Morita share the majority of the remainder of the market with 27%, 16%, and 7% respectively. The most popular model is the Planmeca PM 2002 CC, which represents 16% of the models. The next most common models in federal dental facilities are the Siemens OP-10 and Gendex GX-Pan, both of which had 12% of the market share. The Panelipse II (Gendex), with 7% of the market, rounded out the survey. (Please note the OP-10 and Panelipse II are no longer available). For the Planmeca PM 2002 CC, users appreciated its versatility, wide range of settings, minimal maintenance, and ability to produce high-quality radiographs. Negative characteristics were the unit's complicated operating features and poor accommodation for large-sized patients. The Siemens OP-10 was praised for its dependability, but users complained about its poor head rest design and difficulty in accommodating taller patients. Users of the GX-Pan enjoyed the unit's ease of operation and minimal repair requirements, but disliked the lack of light guides for positioning patients. The Panelipse II was rated as a workhorse, but users found it to have a narrow trough and they had difficulty with patient alignment. The Consumer Satisfaction Scores for these panoramic units were **Planmeca PM 2002 CC (+1.4), Siemens OP-10 (+1.1), Gendex GX-Pan (+1.0), and the Gendex Panelipse II (+0.6).**

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### Triturators

A dependable and proper functioning triturator is important because the physical properties of some dental materials depend on their being mixed at the proper frequency for the correct time. The DIS Equipment Survey found that a majority of the market share by company (51%) is held by the Caulk Company, followed by Kerr (38%). The most popular model, as indicated by market share, is the Kerr Automix (34%). The two other most commonly used units are Caulk's Promix (23%) and Vari-Mix III (21%). The majority of the positive comments received about the Kerr Automix dealt with its reliability, ease-of-use, and ease of disinfection. Users also appreciated the fact that the Automix is easily programmed for mixing speed and time by using plastic cards. Some providers, however, were frustrated because cards are not available for all brands/types of mixed materials. The Caulk Promix was found to be quiet, durable, and infection control-friendly. The most common complaint dealt with the difficulty in removing amalgam capsules from the holder. The Caulk Vari-Mix III was valued by its users for its simple design, and the ease with which its settings can be changed. Users also mentioned that capsules were easy to load into the holder. On the negative side, it was found to be less versatile than other triturators. The Consumer Satisfaction Scores were **Caulk Promix (+1.2)**, **Kerr Automix (+1.0)**, and **Caulk Vari-Mix III (+1.0)**.

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### X-Ray Processors

Automatic x-ray processors increase work efficiency in busy dental clinics by reducing processing times, processing multiple films simultaneously, and producing consistent results. The vast majority of the market share for processors is held by Air Techniques (80%), followed by Gendex (9%), and Dent-X (7%). Market share indicates that the most popular units are all made by Air Techniques: the A/T 2000 (34%), A/T 2000Plus (20%), and the 2000XR (14%). It should be noted that the Air Techniques 2000XR has now replaced the other two models. Positive comments regarding the 2000XR included ease-of-use and low maintenance, but many technicians found the film processing time to be slow. The Consumer Satisfaction Scores were **Air Techniques A/T 2000XR (+1.1)**, **Air Techniques A/T 2000 (+1.1)**, and **Air Techniques A/T 2000Plus (+0.8)**.

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### Steam Sterilizers

Sterilization of dental instruments/equipment is the most essential component of a proper dental infection program. Although several types of sterilizers are available for rendering instruments sterile, one of the most common is the steam sterilizer. The DIS Equipment Survey determined that the largest market share by company is held by Pelton & Crane (47%), while Amsco (now owned by Steris Corporation), and Castle (now called Getinge/Castle) have 16% and 15%, respectively. The most common models were the Pelton & Crane Validator Plus (17%) and Pelton & Crane Magna-Clave (13%); the Castle 3533, Pelton & Crane Delta 10, and Tuttnauer 3870 E each held 4% of the market share. The most frequent positive comments about the Pelton & Crane Validator Plus were its user-friendliness and dependability. Technicians complained, however, that packs tended to be wet when the sterilization cycle was complete. The Pelton & Crane Magna-Clave was found to require minimal repairs, and technicians liked its larger chamber size, but found the recording system too cumbersome. The Castle 3533 was rated favorably for customer support, but many technicians mentioned that repairs were frequently necessary. Reliability was the most frequent positive comment about the Pelton & Crane Delta 10. One drawback was its small chamber size which limits its applications. The Tuttnauer 3870 E was rated easy-to-use, and clinics enjoyed its larger chamber size. Unfortunately, users reported that it required frequent service calls and customer support from the manufacturer was poor. The Customer Satisfaction Scores were **Pelton & Crane Delta 10 (+1.2)**, **Pelton & Crane Magna-Clave (+1.1)**, **Pelton & Crane Validator Plus (+0.8)**, **Castle 3533 (+0.6)**, and **Tuttnauer 3870 E (+0.1)**.

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### Dental Chairs

Dental chairs should be designed to provide patient support and comfort without limiting provider access. As was the case in 1995, A-dec continues to hold a majority of the market share (78%), although the percentage is less than it was five years ago. DentalEZ holds the second largest portion of the market in federal dental facilities (17%). The four most common models were reported to be the A-dec 1040 (31%), A-dec 1005 (22%), DentalEZ E3000 (11%), and the A-dec 1021 (11%). Positive comments about the A-dec 1040 included its well-designed ergonomics, durability, and ease of programming. Patients complained about its lack of comfort, however, and providers disliked its rather short arm rests. The A-dec 1005 received praise from providers because it allowed easy access to the patient. It was also reported to be reliable, but clinicians disliked its upholstery seams because they hampered infection control. Some users noted that they disliked the slowness with which it moved into its various positions. The DentalEZ E3000 was found to be easy to clean, but the upholstery tended to crack easily. The A-dec 1021 was rated as easy to use and disinfect, but patients complained about lack of comfort. The Consumer

Satisfaction Scores were **A-dec 1021 (+1.2)**, **A-dec 1005 (+1.1)**, **A-dec 1040 (+1.0)**, and **DentalEZ E3000 (0.0)**.

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### **Operating Lights**

Key features of dental operating lights are brightness, stability, ease of focusing and positioning, adequate size of the illumination field, proper color temperature, and lack of shadows. The DIS Equipment Survey found that A-dec holds the majority of the market share (62%), followed by Pelton & Crane (21%) and DentalEZ (11%). The most popular models were the A-dec 6300 (62%), Pelton & Crane LFT II (13%), and the DentalEZ Distinction (9%). The A-dec 6300 was praised for its reliability, durability, intensity, and ease of adjustment. Negative features included difficulty in replacing the light bulb and limited durability of the plastic light cover. Positive comments for the Pelton & Crane LFT II included its illumination field size and lack of shadows, but it was judged difficult to clean and had problems with electrical shorts. The DentalEZ Distinction was rated favorably for its ease of bulb replacement, but most clinicians found its intensity and field of illumination to be lacking. The Consumer Satisfaction Scores were **A-dec 6300 (+1.2)**, **Pelton & Crane LFT II (+0.8)**, and **DentalEZ Distinction (+0.3)**.

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### **Dental Units**

Today, dental units are being redesigned to address clinician needs for improved infection control. For example, they are provided with surfaces that are easier to clean and barrier-protect, and handpiece delivery systems that may help prevent percutaneous injury. The DIS Equipment Survey indicated that the majority of the market share by company is held by A-dec (69%) and DentalEZ (27%). The three most popular models are the DentalEZ AS3000 (19%), A-dec 2040 (16%), and A-dec 2122 (10%). There were no positive comments received for the DentalEX AS3000, but negative comments included its poor design with too many plastic components, lack of reliability, and frequent maintenance problems. The A-dec 2040 and 2122 were praised for their minimal down time and ease of use. Positive comments were also made about the ease with which it can be cleaned and the excellent technical support provided by the manufacturer. Some clinicians did not like the design of the bracket arm in the 2040 model and the inability to lock-on the flush button on the 2122 model. Most surveyed practitioners disliked the buggy-whip delivery style on available models. The Consumer Satisfaction Scores were **A-dec 2122 (+1.4)**, **A-dec 2040 (+1.1)**, and **DentalEZ AS3000 (+0.4)**.

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### **Slow-speed Handpieces**

The slow-speed handpiece performs many functions including oral prophylaxis, caries removal, pin placement and chairside prosthetic adjustments. To be effective, a slow-speed handpiece must be capable of variable speeds, demonstrate adequate power, and have a reversible motor. The DIS Equipment Survey found that Midwest had the majority of market share (78%), followed by Star (14%), and KaVo (8%). The most common models were the Midwest Shorty (76%), Star Titan (9%), and KaVo Intraflex (6%). The majority of positive comments about the Midwest Shorty centered on reliability and handling comfort. On the negative side, the Shorty was faulted for its lack of fiberoptics and labor-intensive maintenance. The Star Titan was praised for its dependability, but some providers found the handpiece difficult to hold for extended periods of time. The Intraflex was given high marks for its fiberoptics, but was downgraded due to the tendency for its motor to "freeze." The Consumer Satisfaction Scores were **Star Titan (+1.0)**, **Midwest Shorty (+0.9)**, and **KaVo Intraflex (+0.5)**.

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### **High-speed Handpieces**

Today's dental practices require the use of dependable, efficient high-speed handpieces. With more emphasis on the importance of proper infection control, high-speed handpieces are now routinely heat sterilized between patients. This has caused a higher rate of handpiece failures and an increased need for repairs. The DIS Equipment Survey found that Midwest had the majority of market share (42%), followed by Star (36%), and KaVo (18%). The most prevalent models were the Midwest Tradition (33%), Star 430 SWL (26%), and the KaVo 635 B (8%). The Midwest Tradition was rated favorably for its dependability and compact head size, but clinicians felt the fiberoptics degraded quickly. For the Star 430 SWL, providers enjoyed the small head size, swivel capabilities, and lubrication-free maintenance. The quality of its fiberoptics was judged to be poor, however. Positive comments about the KaVo 635 B included its excellent torque, easy maintenance, and outstanding customer support; no negative comments were mentioned. The Consumer Satisfaction Scores were **KaVo 635 B (+1.7)**, **Star 430 SWL (+1.1)**, and **Midwest Tradition (+0.8)**.

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# LABORATORY

## 61-35 QuickCut Die Saw

(Project 00-12)

The QuickCut Die Saw is a hand-held, motorized saw for sectioning dies on prosthodontic casts. It is claimed to cut pinned casts in less time than a conventional coping saw. When connected to a suction system, a tube that is built into the handle collects dust. The QuickCut Die Saw uses a narrow, diamond-coated blade that is purported to allow the cutting angle to be changed during operation. This unit includes a device that is designed to securely hold dental casts during use and is said to accommodate both full or quadrant casts. For safe operation, the QuickCut Die Saw requires two hands to operate because a safety button on the control box must be depressed with one hand while holding the hand unit with the other. This safety feature should preclude the technician from operating the saw while holding the cast. Although said to be applicable for most situations, the manufacturer advises against using the QuickCut Saw to cut tight margins. The unit weighs 15 pounds, is 9.5 W x 17 H x 14 D, and has a three-foot-long cable. Electrical requirements for the QuickCut Die Saw are 115 V, 60 Hz.

### Manufacturer:

Whip Mix Corporation  
361 Farmington Ave.  
P.O. Box 17183  
Louisville, KY 40217-0183  
800-626-5651  
502-637-1451  
502-634-4512 FAX  
[www.whipmix.com](http://www.whipmix.com)

### Suggested Retail Price:

\$1538.50 QuickCut Die Saw  
\$92.30 Replacement Blades (2)

### Government Price:

\$1007.70 QuickCut Die Saw  
\$63.85 Replacement Blades (2)

### ADVANTAGES:

- + Provides fast, clean, straight cuts resulting in clinically acceptable dies.
- + Vacuum dust collection removes dust from the cutting field and from the operator's breathing zone.
- + Engineered safety feature prevents accidental cutting of user's hands.
- + Reduces hand fatigue compared to manual coping saw method.
- + Cast table is easy to adjust.
- + Is easy to set up.
- + Well built.

### DISADVANTAGES:

- Can not be used in cases where adjacent margins are close together.
- Requires high-volume use to justify cost.
- Has an initial learning curve.

### SUMMARY AND CONCLUSIONS:

The Whip Mix QuickCut Die Saw is a hand-held motorized die saw with built-in vacuum collection device. The saw requires a learning period for users to master it and gain confidence in its two-handed operation. The 360-degree adjustable table provides easy access to the cast and can be used to hold quadrant casts as well. When connected to a vacuum system, the saw maintains a clear cutting field and reduces clean-up time. The diamond-coated, 0.015-mm-thick blade cuts quickly, and its flexibility permits the user to change direction while cutting. The QuickCut Die Saw reduces hand fatigue and sawing time compared to conventional manual methods. Drawbacks include the inability to section dies with close adjacent margins and high initial cost. Users also expressed a desire for an armrest to help them stabilize the saw when making cuts. Evaluators thought the unit is best suited for use in a high-production laboratory. The

QuickCut Die Saw is rated **Acceptable** for use by the federal dental service.

(TSgt Osborn)

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## INFECTION CONTROL

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### 61-36 Bio2000 -- For **Update**, see end of report

(Project 00-16)

Bio2000 is a mint-flavored, full strength, antimicrobial, multipurpose disinfectant that contains chlorhexidine as the active ingredient. The product is placed in a separate water reservoir container and can be used (1) overnight as a dental waterline cleaner and/or (2) continuously as a coolant/lubricant with the high-speed handpieces or ultrasonic scalers. The manufacturer claims that nightly application achieves the American Dental Association (ADA) goal for microbiological quality of dental treatment water (i.e., less than 200 colony-forming units per milliliter). When used continuously, it is purported to increase bur cutting efficiency, reduce aerosol production, and decrease odors and foul tastes during dental procedures. The manufacturer claims that Bio2000 will not corrode metals, clog valves, stain, or cause foaming. The product is available in 17-ounce bottles (10 per case) or in a 2.6-gallon jug with a spigot for ease of dispensing.

#### Manufacturer:

Micrylium Laboratories  
523 Ennslin Drive  
Danville, KY 40422  
(800) 489-8868  
(606) 936-0423 FAX  
www.micrylium.com

#### Suggested Retail Price:

\$99.95 One (1) case of Bio2000 (ten 17-ounce bottles)  
\$185.00 One (1) 2.6-gallon jug with spigot

#### Government Price:

\$70.00 One (1) case of Bio2000 (ten 17-ounce bottles)  
\$129.50 One (1) 2.6 gallon with spigot

#### ADVANTAGES:

- + Produced water quality that met the ADA goal.
- + Easier to use than bleach.
- + Less likely to cause damage to dental units than bleach.
- + Authorized for use by A-dec.
- + No mixing or dilution required.
- + Only a small amount is needed for waterline treatment.
- + Can be used with any type of separate water reservoir.
- + Easy to dispense using spigot provided.
- + Blue color simplifies application.
- + Simple instructions.

#### DISADVANTAGES:

- More expensive than bleach.
- Manufacturer recommends nightly use.

#### SUMMARY AND CONCLUSIONS:

Bio2000 was rated as "Excellent" for all handling properties and clinical acceptability. During the four-week test period, all tested water samples met the ADA goal for unfiltered output water. The product requires no dilution and uses only 2.5 ounces of solution to treat each dental unit. The main disadvantages were its greater cost compared to diluted bleach, and the need for nightly application as recommended by the manufacturer. **Bio2000** is rated **Acceptable** for use by the federal dental services.

(Col Bartoloni)

**Update:** An advertisement for this product appeared in the December 2000 issue of *General Dentistry* that claimed that the product is "recommended and preferred" by the US Air Force. That statement is incorrect. **DIS neither recommends nor prefers Bio2000 over any other such product.** DIS has requested that Micrylium Laboratories refrain from using such advertisements in the future because our standard pre-evaluation agreement prohibits it.

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## **61-37 Jet Shield**

**(Project 99-31)**

The Jet Shield is a device that is attached to the end of a Dentsply air polishing tip and the existing dental unit suction system for the purpose of reducing aerosols during treatment. The device consists of rubber suction tubing, rubber tubing that fits the end of the polishing tip (Jet Shield Assembly), and clips for holding the tubing together. At the end of the Jet Shield Assembly, a round, rubber cup surrounds the air polishing tip. As the air polisher sprays powder against the tooth, the powder is suctioned back through the rubber cup, purportedly reducing the amount of powder aerosol in the dental treatment room. Five of the six parts of the Jet Shield are re-us-able and should be disinfected between patients. The only disposable part is the Jet Shield Assembly. Instructions for both assembly and clinician use are provided with the product.

### **Manufacturer:**

Dentsply Preventive Care  
1301 Smile Way  
P.O. Box 7807  
York, PA 17404-0807  
(800) 989-8826  
(717) 767-8502  
(800) 278-4344 FAX  
[www.prevent.dentsply.com](http://www.prevent.dentsply.com)

### **Retail Price:**

\$84.60 (item number 80579)

### **Government Price:**

\$55.28 (item number as listed above)

### **ADVANTAGES:**

- + Clinical users believed the device was effective in reducing aerosols.
- + Jet Shield Assembly is disposable, which enhances infection control.
- + Minimal time is required for set-up/break-down.
- + Easy to replace after initial set-up.

### **DISADVANTAGES:**

- Adds cost to procedure (\$0.55).
- Decreases visibility of treatment area during use.
- Does not effectively suction all water from treatment area.
- Precludes the simultaneous use of low volume saliva ejector.

### **SUMMARY AND CONCLUSIONS:**

Reducing contaminated aerosols in the dental treatment room is one way of helping to prevent potential staff and patient contamination. The Jet Shield is not meant to take the place of high- or low-volume suction, but is intended to be used as an adjunct in removing the abrasive powder aerosol generated during air polishing procedures. During this evaluation, all the clinical users gave the Jet Shield a favorable rating for its ability to reduce aerosols. The device requires minimal time for installation and disposal, however there is an added cost when using it. The Jet Shield is rated Acceptable for use by federal dental services.

(MSgt Belde)

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